

CLAIMS

What is claimed is:

1. A safety system for use with a brake mechanism of a vehicle, the vehicle having a plurality of stations at which conditions are monitored by the safety system to determine whether vehicle movement should be permitted, the safety system comprising:
a management mechanism adapted to apply the brake mechanism to inhibit vehicle movement;
a plurality of sensors at stations in the vehicle and adapted to sense conditions at the stations;
a solid-state controller operatively connected to the management mechanism and to the plurality of sensors, wherein the controller is adapted to receive signals from the plurality of sensors and, in response to signals from the plurality of sensors indicating a condition that is unsafe for vehicle movement, to actuate the management mechanism to apply the brakes.
2. The safety system as in Claim 1, wherein said plurality of sensors comprises a sensor adapted to sense equipment location at one of said stations.
3. The safety system as in Claim 1, wherein said plurality of sensors comprises a sensor adapted to sense equipment movement at one of said stations.
4. The safety system as in Claim 1, wherein said plurality of sensors comprises a sensor adapted to sense location of people at one of said stations.
5. The safety system as in Claim 1, wherein said plurality of sensors comprises a sensor adapted to sense movement of people at one of said stations.
6. The safety system of Claim 1, wherein the vehicle has an ignition switch, and wherein the controller has a positive power input operatively connected to the ignition switch, so

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that opening the ignition switch shuts off power to the controller, which causes the management mechanism to apply the brake mechanism.

7. The safety system of Claim 1, wherein the management mechanism comprises a vented solenoid valve adapted to block and vent an air line in an air brake, wherein the blocking and venting of said air line applies the brake mechanism.

8. The safety system of Claim 1, wherein the vehicle comprises a hydraulic master cylinder having a piston for increasing brake fluid pressure in a brake fluid line connected to a hydraulic brake mechanism, and a primary piston rod operated by a foot pedal in a driver's cab for powering the piston, wherein the management mechanism comprises a secondary piston rod in the master cylinder adapted to move the piston to increase hydraulic brake fluid in the brake fluid line, and an actuator for powering the secondary piston rod.

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9. The safety system of Claim 1, wherein the secondary piston rod is a sleeve slidably extending around the primary piston rod.

10. The safety system of Claim 1, wherein the vehicle comprises a hydraulic master cylinder having a piston for increasing brake fluid pressure in a brake fluid line connected to a hydraulic brake mechanism, and a primary piston rod operated by a foot pedal in a driver's cab for powering the piston, the management mechanism comprising:

a secondary piston rod in the master cylinder adapted to move the piston to increase hydraulic brake fluid in the brake fluid line, and a spring biasing the secondary piston rod to apply the brake mechanism; and

a release unit counteracting the spring to release the brake, the release unit being controlled by the controller.

11. The safety system of Claim 1, wherein the vehicle comprises a hydraulic master cylinder for increasing brake fluid pressure in a brake fluid line connected to a hydraulic brake

mechanism, wherein the management mechanism comprises a pressure generator fluidly connected to the brake fluid line between the hydraulic master cylinder and the brake mechanism and adapted to increase hydraulic brake fluid in the brake fluid line to apply the brake mechanism.

12. The safety system of Claim 1, wherein the vehicle comprises a mechanical brake mechanism applied by a mechanical linkage between a brake handle and a brake mechanism, and wherein the management mechanism comprises a member for moving the mechanical linkage to apply the brake mechanism.
13. The safety system of Claim 1, wherein the vehicle comprises a mechanical brake mechanism applied by a cable between a brake handle and a brake mechanical, and wherein the management mechanism comprises a member for moving the cable to apply the brake mechanism.
14. The safety system of Claim 1, wherein said plurality of sensors comprises a door switch that signals the controller if a door is not closed.
15. The safety system of Claim 1, wherein said plurality of sensors comprise a wheelchair lift switch that signals the controller if a wheelchair lift is in use.
16. The safety system of Claim 1, wherein said plurality of sensors comprise engine diagnostic sensors.
17. The safety system of Claim 1, wherein said plurality of sensors comprise vehicle diagnostic sensors.
18. The safety system of Claim 1, wherein said plurality of sensors comprise a sensor that signals the controller if a tire pressure is low.

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19. The safety system of Claim 1, wherein said plurality of sensors comprise a sensor that signals the controller if engine oil pressure is low.
 20. The safety system of Claim 1, wherein one of said plurality of sensors is an air pressure sensor adapted to sense the pressure of an air brake air supply.
 21. The safety system of Claim 1, wherein one of said sensors signals the controller if objects or people are close to the vehicle.
 22. The safety system of Claim 1, wherein one of said plurality of sensors is a breath alcohol analyzer.
 23. The safety system of Claim 1, wherein one of said plurality of sensors is an access-code key-pad.
 24. The safety system of Claim 1, further comprising an operator switch electrically connected to the controller and having a release position for directing the controller to release the brake mechanism if the sensors no longer signal any unsafe condition to the controller.
 25. The safety system of Claim 1, wherein one of said plurality of sensors is a vehicle motion sensor, and wherein the controller does not actuate the management mechanism to apply the brake mechanism if the vehicle motion sensor signals the controller that the vehicle is moving above a certain speed.
 26. The safety system of Claim 1, wherein the controller comprises a signal validation circuit that validates signals from the sensors for acceptance by the controller only if the signals arrive at the controller, uninterrupted, for at least 1 to 2 seconds.

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27. A safety system for use with a brake mechanism of a vehicle, the safety system comprising:
a management mechanism adapted to apply a brake mechanism to inhibit vehicle movement;
a plurality of sensors located at a plurality of stations in the vehicle and adapted to sense conditions at the stations;
a controller operatively connected to the management mechanism and to the plurality of sensors, wherein the controller is adapted to receive signals from the plurality of sensors and, in response to signals from the plurality of sensors indicating a condition that is unsafe for vehicle movement, to actuate the management mechanism to apply the brakes;
the safety system further comprising a vehicle motion override system comprising one of said plurality of sensors being a vehicle motion sensor, wherein the controller does not actuate the management mechanism to apply the brake mechanism if the vehicle motion sensor signals that controller that the vehicle is moving above a certain speed.

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28. The safety system of Claim ⁹27, wherein the vehicle motion sensor is operatively connected to a speedometer pickup.

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29. The safety system of Claim ⁹27, further comprising a manual brake-releasing override adapted to release the brake mechanism when the management mechanism has applied the brake mechanism.

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30. The safety system of Claim ¹¹29, wherein the manual brake-releasing override comprises a valve spool of an air valve being accessible to a driver so that the driver pushes on the valve spool to allow air through the air valve to release the brake mechanism.

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31. A method of controlling brakes in a vehicle comprising:
providing a plurality of sensors at locations on the vehicle, the sensors adapted to sense conditions the make vehicle movement unsafe;

providing a controller that responds, to signals from the plurality of sensors indicating an unsafe condition, by actuating a management mechanism that applies vehicle brakes;

wherein the controller validates the signals from the plurality of sensors after the signals are uninterrupted for a certain amount of time and wherein the controller only actuates the management mechanism in response to validated signals.

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~~32.~~ The method of controlling brakes of Claim ¹³~~31~~, further comprising sensing vehicle movement and wherein the controller only actuates the management mechanism if the vehicle is not in motion above a certain speed.

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~~33.~~ The method of controlling brakes of Claim ¹³~~31~~, further comprising providing an operator manual switch electrically connected to the controller, and the controller signaling the management mechanism to release the brakes when the sensors no longer indicate unsafe conditions and after an operator has switched the manual switch to a brake-release position.

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~~34.~~ The method of controlling brakes of Claim ¹⁵~~33~~, further comprising the operator switching the manual switch to a brake-apply position, and the controller actuating the management mechanism to apply the brakes.

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~~35.~~ The method of controlling brakes of Claim ¹⁶~~34~~, further comprising sensing vehicle movement and wherein the controller only actuates the management mechanism if the vehicle is not in motion above a certain speed, except when the operator has switched the manual switch to a brake-apply position.